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CANCER AND CIVILIZATION

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An ADDRESS by

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INTRODUCTION*

May it please Your Majesty,

Your Excellency, Ladies and Gentlemen:

IT IS a great and highly valued privilege to participate in this distinguished and learned gathering concerned with the problem of cancer control. The subject is one which bears upon the welfare of all civilized mankind while demanding the concentrated attention of the highest and most courageous intelligence; for at the root of the cancer mortality problem lie the vices of apathy, ignorance, and cowardice.

It is with pardonable pride that I refer to the efforts for cancer control initiated by the American Society which I have the honor to represent on this inspiring occasion. I am requested to extend to you our very best wishes, and the assurance that whatsoever services we may be in a position to render, we shall consider a great privilege to properly discharge. My own work in connection with cancer research was originally suggested by Dr. Edward J. Ill, of the city of Newark, New Jersey, one of our foremost surgeons, who had become impressed, in the light of his long experience, with the increasing frequency of malignant disease.

The results of my own investigations were presented to the public in a volume on "The Mortality from Cancer Throughout the World," published in 1915 by The Prudential Insurance Company of America. Such time and attention as I have been able to give to the subject have only increased my conviction that cancer is today, more than ever, a most serious menace to all civilized mankind. It is, therefore, most gratifying to those who have brought into existence this movement for the control of cancer that the Belgian Government and the Belgian people should in this respect have assumed a European leadership which unquestionably, in course of time, will result in far-reaching benefits to all concerned.

If I may venture to make the suggestion, I should like to have this gathering resolve upon a Cancer Survey of the Belgian kingdom which would bring into clear relief the essential facts of cancer mortality, treatment and conditioning circumstances which require to be known if control measures are to prove effective. If such a survey should be made it is to be hoped that the methods adopted by the San Francisco Survey may be found useful in connection with a similar Belgian investigation.

In the United States the annual mortality from malignant tumors now approaches, if indeed it does not exceed, one hundred thousand deaths, representing an inconceivable human and economic loss, aside from a lamentable amount of suffering and painful experience. Control in its final analysis rests upon the conviction sustained by generations of medical observations

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that the only sure means of preventing needless deaths, cancer requires the earliest possible recognition of malignant growths and prompt recourse to radical methods of extirpating the offending mass. To attain this purpose it is of the very first importance that the elementary facts of the cancer situation be brought to public attention, as well as to the attention of the public authorities and the medical profession, aiming to replace ignorance by knowledge and apathy and cowardice by an abiding faith in the skill of the surgeon or the physician otherwise in a position to render effective aid.

Once more I wish to convey the assurance of my profound appreciation of the great privilege of participating in this memorable gathering, and I conclude with the hope that the results, in course of time, may be as encouraging to the Belgian people as we have reason to believe they have been during recent years to the people of the United States of America.

Your Majesty, Your Excellency and ladies and gentlemen, I thank you.

CANCER AND CIVILIZATION

The title of this address has been carefully chosen to clearly emphasize the modern aspects of the problem of malignant disease to the peoples of countries that by common consent are generally referred to as civilized, and thus distinguished and differentiated from native races, as yet, more or less, living under conditions of primitive life. The latter, it may be said without fear of successful contradiction, are practically exempt from cancerous affections, though non-malignant tumors may be and often are of common occurrence. My own conclusions, in support of this conviction, rest upon studies and personal investigations among the native Indian populations of North and South America, restricted, however, in the case of the latter, chiefly to the Indians of Bolivia and adjacent portions of Peru.

CANCER AMONG AMERICAN INDIANS

As regards the first, I may direct attention to a return made to me by the Division of Vital Statistics, of the United States Bureau of the Census, for the registration area, for the year 1921. During that year there were recorded 849 deaths of male Indians, of whom 21 died from cancer and other malignant tumors, or 2.5 per cent. of the mortality from all causes. Of the 21 deaths, none were from cancer of the buccal cavity, 13 were from cancer of the stomach and liver, 3 from cancer of the peritoneum, intestines, and rectum, while 5 were of other parts or organs unspecified. The number of deaths of Indian females was 876, of which 28 or 3.2 per cent. were from cancer or other malignant tumors. There were 2 deaths from cancer of the buccal cavity, 14 from cancer of the stomach and liver, 1 from cancer of the peritoneum, intestines, and rectum, 9 from cancer of the female generative organs, and 2 from cancer of the breast. The results of this investigation are in entire conformity to an earlier inquiry, upon which I reported in some detail in my work on *The Mortality from Cancer Throughout the World* (page 151, et seq.), and in which I gave the returns for an Indian population of 52,000 full-bloods, and about 10,000 mixed-bloods, among whom, according to reporting physicians, there had occurred only two deaths from cancer during the year under observation. The conclusion also has the support of the investigations of Dr. Levin, published in *The Studies in Cancer and Allied Subjects of The George Crocker Special Research Fund*, and of the investigations of Dr. Hrdlicka, who, on the basis of an extended study, remarks that "Malignant diseases, if they exist at all—that they do would be difficult to doubt—must be extremely rare."

The foregoing observations have been emphasized by personal investigations among the Indians of Bolivia, among whom I was unable to trace a single authentic case of malignant disease. All of the physicians whom I interviewed on the subject were emphatically of the opinion that cancer of

the breast among Indian women was never met with. Similar investigations of mine among the Navajo and Zuni Indians of Arizona and New Mexico have yielded identical results. Hence the conclusion, supported by a large amount of additional evidence for primitive people throughout the world, that malignant diseases, among native races, are of extremely rare occurrence.

HABITS OF NATIVE RACES

This negative aspect of the cancer problem has never received the attention of qualified observers, to which it is obviously entitled. Why should living under primitive conditions, and especially as regards food, clothing, and occupation, result in a relative measure of freedom from a disease which, to an increasing extent, causes such a heavy loss of life among the population of so-called civilized countries? Is it the less obstructive clothing, or the less irritating nutrition, or the less trying occupations, to which this anomaly must be attributed? Is it the non-wearing of corsets, or the non-lacing of the body, which accounts for the non-occurrence of cancer of the breast in Indian women? As a rule among native peoples, the food eaten is seldom overheated and generally insufficient in quantity to produce hypernutrition. Is it the simple mode of home life, with exemption from exposure to coal smoke? It certainly is not lack of exposure to the tropical sun, which, in certain sections of the world, is said to cause skin cancers among Europeans. It is certainly not the non-liability to non-malignant tumors, which are comparatively frequent among certain native races. It is certainly not the non-liability to skin ulcerations, which are often extremely common, especially in the South American tropics. Whatever the explanation may be it suggests an extended and dispassionate consideration by those who are qualified to undertake this delicate task of scientific inquiry.

If the viewpoint is accepted that cancer is practically absent among primitive races, it by contrast admits of no controversy that cancer is extremely common among civilized peoples and that the rate is increasing practically everywhere, although in some sections a point has been reached beyond which a further material increase is doubtful. Before I consider the recent evidence available on this point, I may briefly touch upon some other matters which only too often receive superficial consideration. I, of course, am most familiar with the cancer statistics of the United States. These, I am sure, are of as much intrinsic merit as the cancer data for any other country or circumscribed area. Our methods of death certificates and disease classification are as advanced as those of any European country, so that for all practical purposes, subject to painstaking care in matters of detail, an international comparison is admissible, when all the facts are taken into due consideration.

ACCURACY OF CANCER STATISTICS

In my judgment the observed increase in cancer in the United States is a phenomenon of our American civilization, which is characterized by a large measure of comfort, much bodily inactivity in adult life, almost universal hypernutrition, and the exposure to many bodily irritants, including, in the

case of women, obstructive clothing in conformity to fashions, which have become more exacting within recent years.

I have no patience with the argument that the high mortality from cancer is the direct result of an increasing average age at death. Of course, this factor has some bearing upon the question, but when fully allowed for in the calculations of cancer death rates by divisional periods of life, the increase in the rate becomes only more apparent.

Nor am I inclined to attach much value to the frequent assertion that the increase in cancer mortality is the result of better methods of diagnosis. Here again, of course, some allowance must be made for an element which is inherent in all disease statistics, but the fact must not be overlooked that the diagnosis of cancer, *as a cause of death*, is very much less difficult than the clinical diagnosis of cancer in the earlier stages of the disease.

Much has been made of autopsy records, as evidence proving the inaccuracy of many cancer diagnoses, and there can be no question of doubt that such errors do occur. But it may safely be asserted that the liability is as great to diagnose a non-cancerous affection as cancerous, as, conversely, to diagnose obscurely cancerous affections as being of the non-malignant type. I have reviewed an immense amount of medical literature on the subject, and I am absolutely convinced that the medical men of old employed possibly more painstaking care in their powers of observation for accurate diagnostic findings than do the medical men of the present period, whose chief reliance is frequently such aids as the laboratory can afford. In brief, granting that errors of diagnosis do, to a certain degree, impair all cancer statistics, they cannot possibly account for the enormous increase in the cancer death rate during the last fifty years.

There is still another and much more important factor, to which attention is seldom directed, and that is the effect of timely operations, in the direction of reducing the cancer death rate, regardless of a persistent and considerable mortality increase. The number of such operations and of other forms of effective cancer treatment is enormous. The effect of such operations and other forms of suitable treatment upon the cancer death rate must be considerable, yet regardless of an immense amount of surgical, radiological and other activities, the rate continues to increase at an alarming pace until we have reached the highest figure ever recorded in our history.

There is another viewpoint on the question of autopsy records which requires thoughtful consideration. It, of course, is self-evident that any autopsy performed for whatever purpose must reveal pathological facts, which could not have been known, even to the very best clinician, aided by the most perfect method of laboratory diagnosis. The patient is treated for the disease most obvious to the eye, and most accessible of ascertainment, while more obscure lesions or impairments, revealed by autopsy, must of necessity escape attention. A patient dies of cerebral hemorrhage and upon autopsy is found to have had a small brain tumor. It is not an indictment of the treatment for cerebral hemorrhage that the tumor at the time of death was not ascertained. A patient may die of chronic appendicitis, without operation, and on autopsy he is found to also have suffered from the begin-

nings of cancer of the intestines. It is not a justifiable charge of malpractice that the cancerous affection was not discovered during the lifetime of the deceased. Such imperfections are inherent in all mortality records, which are conditioned by a conception of the term "causation," which seems to defy precise analysis, as much as the term "cancer" itself. When we speak of "causes" of disease, we more properly have in mind obviously conditioning circumstances that are but the result of antecedent causation, of which the nature is unknown.

CANCER CAUSATION

In this sense I have little faith in the ascertainment of a "cause" of cancer, in the same sense as the term is properly used in certain infections, where the causative factor is clearly known and understood. I question if a single "cause" will be found responsible for cancerous affections, for it would seem much more likely that a multitude of conditioning circumstances are responsible for the irritation, long-continued, which invariably, upon close investigation, is found to be associated with malignant growths.

IRRITATION AND THE TIME FACTOR

The more the fundamental nature of the subject is inquired into, the more conclusive the evidence that, practically without exception, the immediately conditioning circumstances of cancer development are processes of irritability, however induced by underlying conditions, which may fail of precise ascertainment. Certainly the evidence is conclusive that particular forms of cancer do not arise or develop without obvious irritation, as in the case of chimney-sweeps' cancer, X-ray cancer, and the artificially induced tar cancers, in the case of animals under experimentation.

Leitch, in a recent discussion, has advanced the conclusion that "Evidence derived from experimental inquiry into the causes of cancer has not only brought support to the doctrine that cancer follows chronic irritation, but has also very considerably narrowed the issues by demonstrating that certain irritants are very potent agents in producing tumors, whereas others have not been found to possess carcinogenic properties." Leitch here touches upon a profound truth, which goes to the root of the whole question of irritability, as a life-sustaining process.

The foremost authority on irritability, Dr. Max Verworm, has laid down the principle that every disease represents a disturbance of the physiological processes of cell life of the organism and the harmony in their combined workings. In this sense, there is not likely to be found a single "cause" of cancer, but a multitude of conditioning, irritating circumstances, which arouse the cancerous cells into activity. There is a further qualification of this point of view, in the words of John Mill, in his *Essay on Logic*, that "It is not true that the same phenomenon is always produced by the same cause, nor conversely is it illogical that the same result may be arrived at by varying methods of causation." A fire may be due to a chemical irritant, or to friction,

or to the concentration of the sun's rays, yet the results of the fire will be the same.

The essential question involved is rather the length of time during which the irritating processes have been in operation. Cancer has frequently been attributed to traumatism, which, in all probability, merely set in motion pre-existing cancerous processes in course of development. Leitch brings forward an entirely new explanation of cancer occurrence in adult life, and old age, which he attributes not to processes inherent in senility, but rather to the time factor necessary to give to long-continued processes of irritation an opportunity for the development of malignant properties. This conclusion may be reduced to the practical suggestion that in its final analysis particular habits of life, consistently and uniformly continued for many years, may prove to be the predisposing causes of early death; for every habit, long continued, involves some processes of irritation, which may lead to the development of malignant affections. / Hence the supreme importance of the non-development of particular habits, especially as regards forms of obstructive clothing, and still more important of eating in the direction of excessive frequency and superabundance. Habits of drinking highly intoxicating liquors, habits of an excessive protein or carbohydrate diet, habits of smoking, particularly of pipes, all are indirect causative factors in the development of cancerous processes, practically absent in primitive life, but widely diffused and increasing among so-called civilized peoples.

COMPLEXITY OF CANCEROUS AFFECTIONS

It is after all a fallacy, which has hindered much useful investigation, to consider cancer as an entity. Cancerous affections are met with in practically every part or portion of the body, and they should be studied individually, as possibly distinct forms of malignant development. Thus, for illustration, the Australian statistics differentiate over eighty localized forms of malignant diseases. The conditioning circumstances which give rise to primary cancer of the liver must obviously be fundamentally different from the circumstances accountable for cancers of the skin. There is the most urgent need for more specialization in this direction, such as has been fairly well developed in the case of cancer of the breast. It would seem that the most hopeful outlook for the ascertainment of the predominating conditioning circumstances, accountable for specific forms of cancerous occurrences, lies in this direction. We have as yet but a very imperfect understanding of the variation in the local development of cancer in different localities and among different kinds of people. The Australian statistics are in this respect the most useful available, in that they are by sex and with a due regard to age.

It is with pardonable pride that I refer in this connection to a special report on the Mortality from Cancer and Other Malignant Tumors, made by the Division of Vital Statistics of the United States Bureau of the Census in 1914. This report, in a separate classification, differentiates 209 different forms of cancer, while for 29 of these mortality statistics and rates are provided, which reveal a wealth of new and useful information.

ORGANS AND PARTS OF THE BODY AFFECTED

The same classification has been continued to the present time, and through the courtesy of the Chief Statistician of Vital Statistics I have been placed in possession of the required data for 1921. The statistics emphasize, for illustration, the fact that in cancer of the buccal cavity the predominating portions of the mouth attacked by cancerous growth are the jaws. During the year 1921 there were 2,610 deaths in this group, of which 979 were of the jaw; 653 of the tongue; 432 of the lips; 245 of the mouth; and 301 not otherwise classified. There is special need of more painstaking care, on the part of the attending physician, to certify the precise portion of the body affected by the cancerous growth.

As a further illustration I may give the details of an analysis of 28,367 deaths of cancer of the stomach and liver. In this group 18,213 deaths were of cancer of the stomach, 8,775 were of the liver and gall bladder, 1,264 of the esophagus, and 115 of the pharynx. Continuing this analysis I give the details of 10,653 deaths of cancer of the peritoneum, intestines, and rectum. In this group 6,834 were of cancer of the intestines, 3,029 cancer of the rectum and adjacent parts, 724 cancer of the peritoneum and mesentery, while 66 in this group were ill-defined. Of cancers of the female genital organs, there were 11,181, or in detail as follows: Cancer of the uterus caused 10,085 deaths, cancer of the ovaries and Fallopian tubes, 749, cancer of the vagina, 287, and others in this class, 60.

It is regrettable that returns for cancer of the skin should not be available in detail. There is no group of cancerous affections which yields more readily to early treatment and as to which more knowledge is most urgently needed. Attending physicians should, in all cases, specify precisely upon what part or portion of the skin the cancerous affection developed. The remaining group of Cancer of Unspecified Organs or Parts is represented by 14,014 deaths. Of these, cancer of the bladder caused 2,419, cancer of the prostate 1,672, cancer of the pancreas 1,310, cancer of the lung and pleura 1,146, cancer of the bones (except jaws) 825, cancer of the kidneys and suprarenals 806, cancer of the larynx 575, cancer of the brain 204, and cancer of other organs or parts 5,057 deaths.

UNITED STATES

Cancer in the United States has increased from 63.0 per hundred thousand in 1900 to 76.2 in 1910 and 86.0 in 1921. Returns for 1922 are not yet available, but for a selected group of thirty-seven representative cities, including about 25 per cent. of the total population of the entire country, I have secured advance data, which show a further and extraordinary increase in the cancer death rate. During 1912-1916 these cities had an average death rate of 88.9, which during 1917-1921 increased to 97.1 and during 1922 to 104.1. Quite a number of cities now have rates above 100 per hundred thousand of population, among which I may mention Albany, New York, with a rate of 162.9 per hundred thousand; San Francisco with a rate of 161.8; Boston, Massachusetts, with a rate of 145.8; Providence, Rhode Island, with a rate of 136.5;

Sacramento, California, with a rate of 141.7; Topeka, Kansas, with a rate of 137.8; Springfield, Illinois, with a rate of 132.4; Los Angeles, California, with a rate of 132.0; and New Orleans, Louisiana, with a rate of 125.4. The most significant fact revealed by my recent investigation is the truly extraordinary mortality from cancer in the city of San Francisco, now exceeding 160 per hundred thousand of population. The rate there, as elsewhere, has increased from year to year, or to be precise, from 121.7 during 1912-1916 to 148.4 during 1917-1921, and, as stated, to 161.8 during 1922.

SAN FRANCISCO SURVEY

Based upon my urgent plea for a local investigation, the San Francisco Board of Health, through its Medical Officer, Dr. William C. Hassler, has generously agreed to have an abstract made of the fundamental cancer mortality data, from which it is hoped to carry on an original inquiry along entirely new lines and which may prove productive of practically useful results. The investigation will be carried on through the cooperation of the San Francisco Board of Health, the Statistical Committee of the American Society for the Control of Cancer, and several important life insurance companies contributing towards the necessary expense.

The agreed-upon procedure is to first secure a correct transcript of all certificates representing deaths from cancer in San Francisco during the last three years. This material will be subjected to a critical examination, followed in the case of each and every death by a personal inquiry into antecedent facts and conditions likely to have a bearing upon the development of cancerous processes. No time limit has been set for the conclusion of this investigation, which may extend and probably will extend over a number of years. It is intended later on to adopt a similar procedure with regard to living cancer cases, especially such as are receiving treatment in San Francisco public institutions, so that the facts which bear upon questions of causation, development, and treatment will be more thoroughly understood.

NEW YORK CITY

In the city of Greater New York, during the year 1921 there occurred 5,573 deaths from cancer, which during 1922 increased to 5,945. The increase affected both sexes, though not in precisely the same ratio. One significant fact, brought out by an analysis of the mortality for the two years, was that at ages under five there were 26 deaths from cancer and sarcoma during 1921, while there were 25 deaths during 1922. The question of malignant disease in early life has never received the attention to which it is entitled. There is a dearth of positive and conclusive information on the subject, suggestive of special research in a field which is of considerable promise of practical results.

In the New York experience at ages 25 and over, the deaths of women exceed those of men. It is largely because of this fact that the propaganda carried on by The American Society for the Control of Cancer has more actively concerned itself with the mortality from cancer among women, as a

field, which for many other reasons offers a most hopeful outlook, if the advice regarding early diagnosis and the earliest possible qualified treatment is taken to heart. During 1922 there were in Greater New York 2,751 deaths from cancer among males and 3,194 from cancer among females. Of course, the excess among the latter is primarily attributed to the frequency of cancer of the female breast and of the generative organs.

CANCER OF THE BUCCAL CAVITY

The decidedly lower mortality from cancer of the buccal cavity among women is obviously suggestive of the fact that the smoking habit among men is one of the direct inciting causes. In the United States Registration Area during 1921 there were 2,132 deaths from cancer of the buccal cavity among men, against 478 among women. There were 555 deaths from cancer of the tongue among men, against only 98 among women. Of course, the question of cancer of the buccal cavity is very considerably complicated by the coincident occurrence of venereal affections. Sir D'Arcy Powers is emphatically of the opinion that cancer of the tongue practically never occurs unless associated with syphilitic lesions. That smoking habits unquestionably bear upon cancerous affections of the mouth and throat is further emphasized by the fact that out of 115 deaths from cancer of the pharynx, 93 occurred among men and only 22 among women. Likewise out of 575 deaths of cancer of the larynx, 496 occurred among men and 79 among women.

CANCER OF THE LIVER AND GALL BLADDER

There is also a very curious excess of cancer of the bladder among men, for out of 2,419 deaths from this group of causes, 1,707 were males, while 712 were females. Conversely, cancer of the liver and gall bladder is more common among women, for out of 8,775 deaths in this group, 3,475 were of men and 5,300 of women.

CANCER OF THE BREAST

In passing, attention may be drawn to the really extraordinary contrast in the liability of women to cancer of the breast. Out of 7,016 deaths in this group, only 89 were deaths of males against 6,927 of females. While among the former cancer of the breast formed only 0.12 per cent. of the mortality from all forms of cancer, the corresponding percentage for women was 9.08 per cent. It is astonishing that in the vast literature on the etiology of cancer of the breast, so little attention should have been drawn to the enormous possibilities for harm, as the result of obstructive clothing. Cancer of the breast is practically unknown among Japanese women, while I have never been able to trace an authentic case among pure native Indian women in either North or South America.

The mortality from cancer of the breast among females in the American population for the year 1914 was 16.9 per hundred thousand. The corresponding mortality of males was only 0.3. The mortality from cancer of the breast among women greatly increases with every year of life, reaching a **maximum** of 181.5 per hundred thousand at 65 and over. There is urgent

need of more information regarding variations in the death rate from cancer of the breast among women, according to race and especially marital conditions. The latter question has been investigated by the British Government, and it has been shown that cancer of the breast is much more common among unmarried women than among married women. Like considerations apply to cancer of the ovaries, which is also more common among the unmarried. In this respect also much more extended detailed research is of the very first importance.

The statistics of cancer are often carelessly used by those who underrate the supreme importance of accuracy and sufficiency of data upon which conclusions are based. There is a wealth of useful information on the subject, which should be brought to light and made accessible, in a standardized form, to those who cannot possibly have access to original facts, while yet urgently in need of quantitative data, suggestive of leads that it may be well worth while to follow.

INTERNATIONAL STATISTICS

International cancer statistics are rather treacherous ground for discussion. The cancer death rate is so profoundly conditioned by the race, sex, and racial composition of the population, varying with each country and the time element of the observation, that extreme caution is necessary in drawing conclusions from the data available. Yet if any value whatever is to be attached to vital statistics, collected by authority in practically every country of the world, cancer data may be relied upon to indicate approximately a state of fact, suggestive of what I have elsewhere called "Mankind's most sinister menace of health and happiness." In my work on *The Mortality from Cancer Throughout the World* I have brought together an enormous amount of evidence, proving beyond the shadow of a reasonable doubt that the facts on the subject accessible to the student justify no other conclusion than that cancer is on the increase and in some sections of the world, including the United States, at an alarming rate, challenging the attention of the public authorities and medical profession and the population at large.

The limited time at my disposal has not permitted a thorough or complete re-survey of the information for the last decade, but the countries selected for the present purpose represent typically what is called civilized progress, or more precisely, mankind's advance in better health, in better and more abundant food, in more leisure, in science, and art, and last, not least, in medical care. But many of these advantages result in disadvantages and often a heavy price is paid for progress, however confused the evidence may be.

CANCER AND NUTRITION

Foremost among the facts of a materially progressive civilization is excessive food indulgence and the overemphasis which is laid upon body weight as evidence of physical well-being, though the actual condition may be the reverse. Native races living under primitive conditions rarely present evidence of overnourishment, or more accurately of overfeeding, except on occasions of an unusually abundant food supply. In the United States over-

nutrition is the rule rather than the exception among practically every element of the population. There is also, no doubt, a vast amount of malnutrition, resulting in metabolic disturbances, of which the increase in diabetes is one of the most suggestive symptoms. Canada, Australia, England and Wales are much alike in this respect. Germany before the war, Holland, Switzerland, and a number of other countries, may be said to have exceeded the United States in the extent to which excessive food indulgence is common, both as to quantity of food consumed and the number of meals eaten during the day. The same considerations apply to the well-to-do and the rich, among whom four meals a day and even five are not uncommon. With excessive food indulgence must come metabolic disorders and a higher rate of degenerative diseases, neurotic affections, favored by irregular hours of rest and sleep.

CANADA

For the Dominion of Canada complete cancer mortality data are only available for 1921-1922. Based upon the enumerated population the cancer death rate for 1921 was 75.4 per hundred thousand, while for 1922 the rate was 77.8. In 1921 there were 4,826 deaths from cancer, against 5,092 deaths in 1922. Broadly speaking the cancer mortality experience of Canada, considered by large cities, conforms to the corresponding experience of the United States.

AUSTRALIA

Of special interest and great practical value are the cancer mortality statistics of the Commonwealth of Australia. The changes in the rates conform quite closely to the corresponding rates of the registration area of the United States. During 1911 the male rate was 72.6 per hundred thousand, increasing to 87.1 by 1921. The female rate during the same short period increased from 72.7 to 86.3. For both sexes combined the rates increased from 73 in 1911 to 87 in 1921. By specified organs and parts the changes in the death rate during the last decade have been as follows: Cancer of the buccal cavity has increased between 1911-1921 from 6.0 to 6.1; cancer of the stomach and liver has increased from 27.4 to 31.8; cancer of the peritoneum, rectum, and intestines has increased from 17.6 to 24.2; cancer of the female generative organs has increased from 15.0 to 17.8 per hundred thousand of female population; cancer of the female breast has increased from 5.2 to 6.0 per hundred thousand of female population; cancer of other organs or parts, not specified, has increased from 17.3 to 19.0. The evidence in this case is of exceptional value, in that Australia, corresponding to the United States, may properly claim a highly educated and efficient medical profession, while the Government has developed perhaps the most thoroughly thought-out system of registration of vital statistics. Of the 4,768 deaths from cancer in the Australian Commonwealth during 1921 only 42 were attended by a coroner; all the remainder, or 4,726, having been attended by medical practitioners. Of the 4,768 deaths from all forms of cancer, 297 were sarcomas. The cancer statistics of the Australian Commonwealth are published in admirable detail, affording a vast amount of useful material for intensive statistical research.

NEW ZEALAND

Quite similar have been the changes in the cancer death rate of New Zealand. According to the New Zealand official Year Book for 1921-1922, "Cancer is annually responsible for more deaths in New Zealand than can be assigned to any cause, other than organic diseases of the heart. The increasing prevalence of cancer is in fact causing no little concern throughout the civilized world." The cancer death rate of New Zealand has increased from 79.7 in 1911 to 86.3 per hundred thousand in 1920. In 1919, however, it reached 90.2. It is explained in this connection that in New Zealand "Deaths from cancer are, on the average, now occurring later in life than formerly." But without an extended and critical investigation all such statements are open to question.

ENGLAND AND WALES

The crude cancer death rate of England and Wales has increased from 99.2 per hundred thousand in 1911 to 121.5 in 1921. For males the increase has been from 89.1 to 114.2, while for females the increase has been from 108.7 to 128.1. Cancer of the buccal cavity, probably one of the most easily diagnosed forms, has increased from 6.3 to 7.5. For males the increase has been from 11.3 to 13.7, while for females the increase has been from 1.7 to 1.8. Cancer of the stomach and liver has increased from 33.8 per hundred thousand to 38.9, or respectively for males from 36.4 to 43.8 and for females from 31.8 to 34.4. Cancer of the peritoneum, intestines, and rectum has increased from 18.8 to 25.7, or respectively for males from 19.1 to 25.9 and for females from 19.6 to 25.5. Cancer of the female generative organs has increased from 24.3 to 27.5. Cancer of the breast has increased from 9.5 to 12.3, or respectively for males from 0.1 to 0.2 and for females from 18.3 to 23.7. Cancer of the skin has increased from 2.3 to 3.0, or respectively for males from 3.4 to 4.0 and for females from 1.8 to 2.0.

All of the foregoing data would be materially impaired in value, if they were not confirmed by a further increase in the mortality from cancer of other specified organs and parts. In other words, there has been no material amount of shifting of diagnosis, in response to demands for greater exactness in death certifications. The mortality from other forms of cancer or of other specified organs has increased from 15.7 to 19.6, or for males from 20.2 to 26.6 and for females from 11.2 to 13.2.

Nor has there been a shifting from benign tumors to malignant tumors, as might be assumed. The mortality from tumors, not returned as malignant, excepting brain tumors and tumors of the female generative organs, has increased in the period under observation from 1.0 to 1.8, or respectively for males from 1.0 to 2.0 and for females from 0.9 to 1.5.

When the foregoing crude death rates are subjected to critical statistical consideration, some of the conclusions are more or less modified. But the change resulting does not impair the general conclusion that cancer of practically every organ and part, in England and Wales, during the last ten years has increased to proportions never before reached in the history of British medicine.

There has, of recent years, been a disposition to criticize the clinical diagnosis in many cancer cases as insufficient for the purpose of accuracy in death certification. While unquestionably the assistance of pathologists and laboratory workers has been of immense benefit, it has not gone to the root of the question of disturbing the general accuracy of cancer diagnosis made at the time of death. The latter, of course, represents a totally different set of facts from cancer diagnosis in the living patient, particularly during the very early stages of the disease. The more closely the clinician works in harmony with the pathologist and the laboratory worker, the better; but whoever has dispassionately considered the facts must agree that in a large majority of cancer cases the disease in its terminal stages is not difficult of accurate clinical diagnosis and certainly not in the case of cancer of the readily accessible organs or parts of the body.

SWITZERLAND

The statistics for Switzerland are extremely suggestive. For reasons unknown, Switzerland seems to be exceptionally subject to a high cancer death rate, affecting the country as a whole, as well as its particular parts. The cancer death rate of Switzerland has increased from 116.6 to 125.9 per hundred thousand, during the period 1911-1920, while the rate for the Canton of Basel has increased from 128.2 to 141.8 during the same period. Still more alarming is the observed increase in the rate for Zurich from 105.3 in 1911 to 151.6 in 1922. Quite curiously the rate for Bern is somewhat lower, although the increase is equally suggestive, having been from 84.8 in 1911 to 99.6 in 1920. In marked contrast is the observed increase in the city of Geneva from 112.7 to 152.6, during the same period. No section of Europe would seem to offer better opportunities for specialized research into the underlying conditioning circumstances possibly responsible for cancer frequency than Switzerland. It is a country with an admirably organized statistical service and a medical profession of the very highest standing. Death certification is probably as satisfactory in Switzerland as it is anywhere.

FRANCE

Much to my regret I have been unable to secure trustworthy data for France, in view of profound population changes, as the result of the war. In 1911 the French cancer death rate was 80.8, which by 1913 had increased to 83.2. The rate for Paris, which in 1911 had been 111 per hundred thousand, had by 1921 increased to 127. Even more suggestive are the statistics for Havre, where the cancer death rate increased from 121.9 to 137.1 during the decade under review. Still more suggestive are the statistics for Lille, which in 1911 report a cancer death rate of 133.6 but which had increased by 1921 to 156.2. I had hoped to have been able to examine more thoroughly into the French cancer statistics, but much to my regret the time was not available. The data are certainly suggestive of the value of critical examination of the facts, which may possibly have received consideration on the part of the French Society for Cancer Research.

BELGIUM

Equally unsatisfactory, for the present purpose, are the statistics of Belgium. The only data useful for the purpose are for the period 1911-1913, during which the cancer death rate of the Kingdom increased from 68.6 to 71.5. The data for Antwerp show an increase from 77.4 in 1911 to 101 in 1921. For Brussels, however, there was a slight decline from 111.9 in 1911 to 106.1 in 1920. Practically the same experience was had in Liege, where the rate decreased from 111.5 in 1911 to 105.4 in 1920. Later statistics are unfortunately not available to me.

HOLLAND

An alarming situation is revealed by the statistics of Holland, where the cancer death rate has increased from 108.8 in 1911 to 115.0 in 1921. In the city of Amsterdam during the same period the rate increased from 115 to 136. Various studies have been made of cancer frequency in Holland, but apparently thus far no energetic movement has developed aiming at a deliberate reduction in the mortality from disease, as the result of educational efforts, reaching both the laity and the medical profession.

GERMANY

For Germany no statistics have been available to me for the country as a whole, but certain statistics of representative German cities are extremely suggestive. The death rate of Berlin increased from 115.9 in 1911 to 137.1 during 1919. The cancer rate of Hamburg increased from 101.6 in 1911 to 106.7 in 1918. The Munich cancer death rate declined from 162.1 in 1911 to 151.6 in 1921. A substantial increase occurred in the city of Leipsic in the same period. A trend towards a higher rate can also be observed in the case of Cologne.

NORWAY

In Norway during the period 1911-1918 the cancer death rate increased from 96.2 to 97.1, while in the rural communities the rate declined from 94.2 to 93.2. In the principal towns of Norway, however, the rate increased from 101.2 to 105.9; but separately considered for Bergen the rate increased from 98.2 to 120.3, while for Christiania the increase in the rate during the period 1911-1921 was from 101.2 to 148.7.

DENMARK

In the Kingdom of Denmark the cancer death rate has declined from 143.3 in 1911 to 136.3 in 1921; and in the cities of Denmark from 141.9 to 139.4. The rate for Copenhagen has slightly declined from 156.0 to 150.9, and even a more marked decrease is shown for Fredericksburg, from 187.2 in 1916 to 152.6 in 1921. Of course, when extremely high cancer death rates are reached it is only natural that a reaction should occur in response to natural forces which make for the conservation of human life. Each and every organic disease has apparently a fairly fixed limit, beyond which an increase in the death rate is not likely to take place. This limit, in the case of cancer,

may be approximately placed at 150 per hundred thousand. There are certainly very few communities and large areas throughout the world in which the cancer death rate exceeds 150, although as pointed out in the case of San Francisco, the rate there has reached 161, and apparently the maximum limit has not yet been passed.

ITALY

In marked contrast to the comparatively high cancer death rate of northern and central Europe are the relatively low rates for Italy and Spain. The cancer death rate of Italy has increased from 66.8 in 1911 to 68.4 in 1918. The rate for Milan has decreased during the period 1911-1921 from 134.6 to 126.2, while the death rate for Turin during the same period has declined from 113 to 85. The cancer death rate of Rome declined from 113 in 1911 to 77 in 1921, while the rate for Naples declined from 68.3 in 1911 to 66.4 in 1916. The Italian statistics would seem to confirm the theory that the relatively low degree of economic prosperity in that country, among the general population, accounts for the comparatively low cancer death rate, but this does not apply to the large centers of population, especially in the north of Italy; although the disastrous economic after-effects of the war may possibly account for the observed decline in the rate during recent years.

SPAIN

Similar conclusions apply to Spain, where the cancer death rate has increased from 51.4 in 1911 per hundred thousand to 59 in 1921. The rate for Madrid increased from 84.5 to 95.7, the rate for Barcelona from 89.4 to 105.1; while the rate for Seville has decreased from 112.5 to 92.9 during the same period.

As I have said at the outset International cancer statistics require to be dealt with in an extremely cautious manner, and I would not wish to have conclusions drawn from the foregoing summary which the facts would not justify. The data reveal without question a decided trend towards a higher cancer death rate in practically all the principal countries and in most of the larger centers of population. It is only in the case of countries which have suffered economic deterioration or in which a comparatively low degree of material prosperity prevails that the cancer death rate shows a relatively low figure and a death rate on the decline.

UNITED STATES

Returning once more to the statistics for the United States, which are fortunately available in considerable detail, and which represent returns for about 85 per cent. of the total population, it has been pointed out that the rate for 1921 was 86 per hundred thousand. The rate has persistently increased during the last four decades and every new investigation confirms the conviction that the cancer mortality is progressively on the increase in practically every locality and every section of the country. The rates vary widely, being highest in New England, California, and the State of New York. Summarizing the results of the investigation for 1921 Dr. W. H. Davis, Chief of Division of Vital Statistics, remarks that "The adjusted rates show that the northern

states have comparatively high and the southern states comparatively low cancer mortality, and that apparently the white and colored races seem equally susceptible to the disease." The negro race, in America, in its mode of living, food, clothing, etc., conforms in all essentials to the mode of living common to the white population. In so far as habits, or other elements of the environment, predispose to cancerous conditions, they are probably equally effective among the white and the colored, in the same localities, but less effective in the south than in the north.

When the returns are analyzed for individual cities, some extraordinary conditions are revealed, which at least are beginning to attract attention. The highest cancer death rate for North America is met with in the city of San Francisco, where during 1922 a rate of 162 per hundred thousand prevailed, compared with 152 during the previous year. There is fair prospect of a thorough investigation into all the fundamentally related facts, which may possibly bear upon cancer causation or the conditioning circumstances, affecting cancer occurrence, but it will be several years before the results of the Survey, now in progress, will be available. It is hoped that the San Francisco investigation will develop methods useful for other communities in which cancerous affections may be unusually prevalent. The investigation should certainly dispose of many controversial matters, which are a serious hindrance to progress in cancer research.

The wealth of cancer data for the United States is enormous. For purposes of special illustration, I have selected the State of New York and the city of Chicago and these will suffice to emphasize the seriousness of the present situation and the imperative urgency of control measures, as a result of which a reduction in the excessive death rate may be anticipated with confidence.

NEW YORK STATE

New York State in 1898 had a population of 3,300,000 and a cancer mortality of 2,006, equivalent to a rate of 61 per hundred thousand. By 1908 the mortality had increased to 3,243 deaths and to a rate of 73 per hundred thousand. Ten years later, or in 1918, the mortality had reached 4,867, while the rate was 90, or about 50 per cent. in excess of the rate of twenty years before. In 1921 the number of deaths was 5,573, while a rate of 97 was reached, based on a population of 5,700,000.

Those who are familiar with actual conditions in 1898 will not readily admit that the medical profession failed to recognize or properly diagnose one death from cancer in every three that might have occurred.* Of course, enormous progress has been made in the earlier diagnoses of cancer as a disease, but this does not materially affect or apply to the diagnosis of cancer as a cause of death. There is no question of doubt that some such improvement has taken place, both as regards diagnosis and death certification, but the effect of this upon the cancer death rate is easily offset by the larger number of lives that are being prolonged or conserved, as the result of timely operation, and in which death from cancer does not occur, although the disease itself had been present. I have long been of the opinion that the tendency

*If the rate for 1921 had actually prevailed at the time.

towards malignant disease is decidedly greater and more serious than as revealed in the upward trend of the cancer death rate, but a still further rise in the rate is checked by the increasing extent to which cases come to early operation, or conversely the degree to which inoperable cases are diminishing.

CHICAGO

The data for Chicago, extending over a longer period of time, provide ample support for the contention that the disease has been progressively on the increase, for certainly half a century or more. In 1867, which is the first year for which the data are available, the cancer death rate of Chicago was 20 per hundred thousand. (In England and Wales during 1838-1842, the cancer death rate was 17.3.) By 1877 the Chicago cancer death rate had increased to 30.7 and by 1887 to 39.6. (In England and Wales the rate during 1881 was 52.0.) By 1897 the Chicago rate had increased to 49.8 and by 1907 to 75.1; by 1917 to 87.8 and by 1921 to 95.8. Is it conceivable that these profound mortality changes can be explained by improved diagnosis or better methods of death classification? Certainly every disease is today better diagnosed than in former years and perhaps no disease is more thoroughly understood than pulmonary tuberculosis, which has undergone, fortunately, a very material decline. In New York State the mortality from *all* causes, since 1908, has declined from 20 to 11 in 1921, while the Chicago death rate since 1897 has gone down from 21 to 11, which is about the lowest figure reached by any large city at the present time; yet regardless of this almost incredible improvement in human longevity and general health, there has been a most menacing increase in the cancer death rate, which stands out as the greatest medical problem of modern times.

HEREDITY AND INFECTION

I would like to have said a few words on the alleged inheritance of cancer or its occurrence as a family disease. But this would require more time than is available for the purpose. In brief, I may say that I am unconvinced by any evidence on the subject that cancer is either transmissible through heredity or through direct means of infection from one person to another. The evidence in support of these theories is derived from animal experimentation and not from human records. Such data as are at all applicable to the point at issue are decidedly suggestive of the conclusion that the disease is not, as such, transmitted from parent to offspring, while its transmissibility on any theory of infection or parasitical origin is opposed to generations of medical and surgical experience.

CONCLUSIONS

No argument derived from statistics alone can, however, set aside the charge that the increase in mortality is not, in a measure, the result of improved diagnosis. The available evidence in this respect is overwhelming and to the effect that errors occur and among cancers of every organ and part. What I insist upon, however, is that the actual increase in the disease is sustained by the statistics available, and that such errors as are met with in every-day practise are not of such a degree as to explain the steady and considerable rise in the cancer death rate in every civilized country of the world. If we were to grant that the whole of the increase was attributable to improved diagnosis, we would be justified in the lamentable conclusion that the medical diagnosis at death is indeed a most deceptive procedure, and that many people, in a most serious condition, are in large numbers treated for diseases from which they do not suffer, while others are not treated for ailments which demand most imperative qualified attention. No medical man, familiar with the facts of general practise during the last fifty years, will be ready to grant such a sweeping indictment of the major portion of the medical profession throughout the world. Nor is there evidence to prove that skill in cancer diagnosis at death has made such prodigious progress, for illustration, in the State of New York, as to account for an increase in the cancer death rate from 61 per hundred thousand in 1898 to 97 in 1921. We may properly ask what has been the effect upon the cancer death rate in the meantime, of the increasing efficiency in surgical operations and other methods of qualified treatment, which in numerous cases must have resulted in a cure. In my judgment the effect of operations, etc., in all probability balances the improvement in diagnosis at death and the better methods of death classification since the introduction of the Bertillion International System.

CANCER TREATMENT

The treatment of cancer does not, of course, fall within the scope of this discussion, the primary purpose of which is to emphasize, and more accurately in view of my many previous statements to the same effect, the menace of malignant diseases as a scourge of civilized mankind. If we roughly assume that the earth's civilized people, in the accepted sense of the term, may be placed at 500,000,000, and that among these the normal death rate is not less than 80 per hundred thousand, we are confronted with an annual loss of not less than 400,000, a truly imposing aggregate, which cannot be far from the actual truth.

Among the remainder of the world's population, which may be assumed to amount to 1,200,000,000, the true cancer death rate cannot exceed 10 per hundred thousand, thus the total world's mortality from cancer is approximately 500,000 deaths per year, or a staggering total, which to

reduce by control measures, even to the extent of 10 per cent., would involve enormous efforts and vast expenditures of money; for it is idle to talk of cancer prevention, since the onset of disease or its essential causative factors are at present largely unknown. Prevention, in any event, can only become operative after many years of education in personal hygiene, if the assumption is correct that the major conditions, resulting in the development of malignant tumors, are nutritional in their origins. From the point of view of industrial hygiene, something no doubt may be done, while a discontinuance of habits predisposing to cancer falls largely within the scope of personal hygiene. Public hygiene, at best, can do but little, except perhaps in the direction of controlling certain nuisances, particularly smoke and fume exposure, which may, under given conditions, increase the liability to cancerous affections.

The seriousness of the present situation is enormously increased by medical incompetency and downright malpractise. No disease lends itself more peculiarly to public deception than cancer. No disease offers greater temptation to the incompetent physician for needlessly prolonged but futile methods of treatment, to a point where the patient has reached an inoperable condition and seeks in vain for a cure at more competent hands. The amount of cancer quackery, among the credulous, even though persons otherwise of a high order of intelligence, is inconceivable. "Time out of mind" cancer cures have been offered with the utmost assurance of favorable results, only to be replaced by others under equally high-sounding pretensions. It was, perhaps, pardonable on the part of Benjamin Franklin, as far back as 1755, to speak highly of a cancer of the breast—"Cured by a kind of shell, cut at the proper time, by some man of great skill (as they say), which has done wonders in that disease among us, being worn for some time on the breast." Yet at the present time equally absurd assurances are accepted in entire good faith, on the part of those who otherwise may claim to intelligence above the average.*

CANCER CONTROL

During the long intervening period, a period truly marvelous in its progress in human intelligence, and in the appreciation of what is fact and truth in every-day life, we have yet failed to realize clearly the obvious fallacy of cults and quacks, which pretend to cure malignant growths with powders, plasters, ointments, etc.—yea, even with prayers, and what is called "methods of mental healing." No more serious charge could be brought against the medical profession and the public authorities, responsible for the safeguarding of the public against imposition or fraud, than that quackery in cancer cases should go unchecked, if indeed it is not more rampant today than at any time in the past. In the United States, countless alleged cancer cures do infinite mischief, without let or hindrance, to the sorrow of the hapless victims of the most dreadful of all human afflictions. The control of the cancer scourge, therefore, demands heroic measures of drastic interference with all

*See "The Medical Side of Benjamin Franklin," pages 20, 27, 58. Philadelphia, 1911.

that favors needless deaths from cancerous afflictions. But apathy and cowardice oppose the progress required before even a slight measure of reduction in the cancer death rate can be brought about by deliberate means.

The only hope lies in *education*: education of the physician in earlier diagnosis and more effective method of cure; education of the public in the earliest observable indications of tumor growth, benign or malignant, as the case may be; education of the medical profession and public authorities in the urgency of means whereby quackery will be suppressed as far as this may be attainable; finally, education of public-spirited citizens to support any and every form of cancer research that affords ground for hope that cancer knowledge may be advanced, particularly in the direction of more effective methods of treatment and cure. For cancer there will be, even though a cancer cause were discovered and disclosed to a waiting world. We know the cause of leprosy and tuberculosis, yet these diseases continue to prevail. We know the cause of anthrax and malaria, yet the outlook is dark that these diseases will be banished from the earth. We know the cause of yellow fever, yet sporadic cases continue to be met with. Causation and consequences may lie far apart. The imperative duty of the hour is to emphasize in season and out the urgency of an intelligent interest in any and every kind of abnormality met with in adult life, amplified by the duty of the earliest possible diagnosis of the disease and the supreme importance of the best possible treatment, be it what it may.

SUMMARY OF CONCLUSIONS

Summarizing, very briefly, the foregoing observations and conclusions, I would say, as follows:

First.—Cancer, in the light of my investigations, is essentially a disease of civilized countries, and its increasing frequency is, in a large measure, no doubt, the direct result of faulty habits and the abnormalities of life, induced by the complex conditions of the modern environment, favored chiefly by food abundance, nervous strain and the numerous by-products of material prosperity.

Second.—Cancer is extremely rare among native, or so-called uncivilized races, typified in the western world by the North and South American Indians, for whom a reasonable amount of trustworthy information is available, all of which is indicative of the relative infrequency of the disease under primitive conditions of life.

Third.—Cancer is today excessively common in adult life, in practically all the civilized countries of the earth, reaching in some cases proportions exceeding the corresponding mortality from pulmonary tuberculosis.

Fourth.—Cancer in most modern countries is unquestionably on the increase, and in some sections, including portions of the United States, at an alarming rate.

Fifth.—The approximate annual increase in cancer mortality may be placed at about 2 per cent.

Sixth.—The aggregate mortality from malignant disease among the civilized portion of the world's population cannot be much less, if it does not exceed, half a million deaths per annum.

Seventh.—Cancer is apparently correlated to a variety of conditioning circumstances, all involving factors of irritation of the different organs and parts of the human body. Of the irritants which predispose to malignant growth, faulty habits of nutrition are, in all probability, of predominating importance, particularly in cancer of the liver and stomach, and cancer of the peritoneum, rectum, and intestines.

Eighth.—Another important element, most likely of a predisposing nature, is obstructive clothing, especially among women, as made evident by the large and increasing mortality from cancer of the breast, which is practically never met with among the women of native races, living under primitive conditions of life.

Ninth.—Still another factor, of very obvious importance, is smoking, which bears a direct causal relationship to cancer of the buccal cavity, among men. Cancers of this type are exceedingly rare among women.

Tenth.—There is no evidence that cancer is transmitted by heredity, although further research in this direction is most urgent. In my judgment, the evidence derived in this respect, from animal experimentation, has no direct bearing upon the occurrence of cancer among human beings.

Eleventh.—Like considerations apply to the theory of cancer being transmitted from person to person, by means of infection. No evidence has been forthcoming tending to prove that the theory of a parasitical origin is more than a matter of conjecture. At the same time, there is no doubt but that parasitical infections may act as local irritants, and, in this respect, they are entitled to profound consideration. An important case in point is, for illustration, the occurrence of cancer of the liver among Europeans on the West Coast of Africa, which is only met with in cases of liver fluke.

Twelfth.—In view of the foregoing, the theory of cancer houses, cancer streets, or cancer localities, does not bear qualified analysis. The occurrence of such a phenomenon is to be attributed rather to the age factor, or to other conditioning circumstances, which can be brought to light only by means of a thorough investigation.

Thirteenth.—Such an investigation is now in progress in the city of San Francisco, where a complete cancer survey is contemplated, of the mortality during the last three years, inclusive of all the essential facts which can be ascertained by means of a supplemental inquiry into antecedent conditions, including, at the same time, living cancer patients, under treatment in local institutions. This investigation is being carried on through the cooperation of the San Francisco Board of Health, the American Society for the Control of Cancer, The Prudential Insurance Company of America, the Pacific Mutual Life Insurance Company of Los Angeles, and the John Hancock Mutual Life Insurance Company, of Boston.

Fourteenth.—The increase in cancer during the last decade reemphasizes all of the conclusions advanced in my comprehensive investigation of the mortality of cancer throughout the world, published in 1915. The increase has been most pronounced in the United States, in Canada, in Australia and New Zealand, in England and Wales, in Switzerland, in Holland, and in Norway, Sweden, and Denmark. The evidence is less conclusive regarding Belgium, France, and Germany, where post-war conditions, no doubt, profoundly modify the mortality experience.

Fifteenth.—The evidence of cancer frequency and increase for southern European countries seems to support the conclusion that a less prosperous condition of the population acts as a check upon the trend towards higher rates in economically more advanced countries. This conclusion does not apply to the large centers of population in southern Europe which show con-

ditions practically identical with the large centers in the north of Europe, and elsewhere.

Sixteenth.—In the United States the cancer death rate during the last decade has increased from 74 to 86 per one hundred thousand of population. It is conservatively estimated that we have now in the United States about one hundred thousand deaths from cancer per annum. For large American cities, representing about one-fourth of the total population, the rate during 1922 reached 104.1 per one hundred thousand, while for the city of San Francisco the rate was as high as 161.8 per one hundred thousand.

* *Seventeenth.*—In view of the evidence brought together, the conclusion is justified that cancer today represents the most serious menace to health and life of practically all civilized races and that the question of cancer control is, therefore, of paramount importance to the public, the medical profession, and the public health authorities of the governments concerned. It is idle, of course, to speak of the prevention of cancer, since the precise time of onset of the disease cannot be ascertained. The problem of control, therefore, aims rather at the prevention of deaths from cancer and the amelioration of the unhappy condition of cancer patients, as the result of more qualified methods of treatment, aiming always at a cure.

Eighteenth.—What has been done in this respect by the American Society for the Control of Cancer challenges the admiration of all who are familiar with the facts. An immense body of the laity has been educated in the essential facts of cancer development and the supreme urgency of the earliest possible diagnosis and the earliest possible qualified treatment of the disease. The efforts made by the Society would have been more effective if the evidence regarding the possibility of control measures had been more effectively presented. There is the most urgent need for extended investigations into the after-effects of surgical, radiological, and other methods of treatment, required to impress upon the public the appalling truth that the large majority of cancer patients come for treatment to the physician, or the surgeon, when the disease has reached an inoperable stage and when death has become a foregone conclusion.

Nineteenth.—While progress has been made, much remains to be done. The most sinister aspect of the cancer situation is the enormous amount of quackery and the incompetence of many physicians, who fail to realize the seriousness of the disease, at a time when qualified treatment still offers an encouraging hope. The control of wrongful methods of treatment, including persons who are not medically qualified, is the duty of the State, whose neglect in this respect is lamentable evidence of inefficiency on the part of the public authorities, as well as on the part of the medical profession, who should have courageously dealt with the solution of a growing evil.

Twentieth.—The most urgent need at the present time in the furtherance of measures for cancer control is a consolidation of surgical experience revealing post-operative results with a due regard to the operative condition of

the patient at the time of treatment. The fragmentary evidence which is available is insufficient for public purposes, for in its final analysis the laity is only impressed by numerical data sufficient to substantiate the conclusion advanced. What we require to know is what the results of operative treatment of cancer have been during recent years and the extent to which life has been prolonged or extended. The usual method of considering a case cured after three years is no longer sufficient for modern needs. We should know how many cases have survived the operation without a recurrence 5, 10, and even 15 years and more.

Twenty-first.—Equally urgent are investigations into the ascertainment of the results of radiological treatment with a due regard to the type of cancer treated, the age of the patient and the previous duration of disease. It is with pardonable pride, in this connection, that I refer to a recent report of the New York State Institute for the Safety of Malignant Diseases, according to which “important advances have been made in the treatment of cancer during the past year, and that comparative measurements of the penetrating rays of radium and X-ray show that radium has the advantage by about 10 per cent., but that improvements made in the X-ray make it almost the equal of radium as cancer treatment.”

This is a most important revelation suggestive of the wider use of X-ray treatment which, of course, is more readily available than radium. According to the report referred to “the time for giving a full dose of cancer treatment by radium or X-ray has been reduced from 8 hours a year ago to 2 hours at the present time.” Hence the conclusion that “one of the most valuable advances is in the combined treatment of radium and X-ray, and that the advantage of this method is very marked.” The results show that about one-third of all the cases of uterine cancer which come for treatment gave permanent results and a great many were materially helped. The great difficulty in the whole question is in obtaining cancer cases sufficiently early. But in the early cases the Institute is able to report that in cancer of the lip 80 per cent. of the early cases were cured, while in the operable cases 60 per cent. were cured and in the inoperable cases 40 per cent. It is evidence of this kind which is most useful in connection with modern efforts of reaching the laity.

Twenty-second.—I am decidedly of the opinion that cancer should be made a reportable disease. It is the proper function of the health department to take cognizance of the conditions frequently met with in cancer cases previous to receiving treatment, while at the same time it is essentially the function of the health department to protect the community against the practises of those who are not qualified to render the proper services required.

Twenty-third.—Finally, I may reemphasize the conviction forced upon me as the result of a painstaking inquiry into the subject and supported by the best surgical judgment of the present period that, as said recently by Dr. Mayo, “there is no [medical] cure for cancer.” The hope of the patient lies in the earliest qualified surgical and radiological or X-ray treatment supplemented by such methods as may otherwise commend themselves to the surgeon

in charge. The enormous mortality from cancer is unquestionably primarily the result of faulty habits or malnutrition, and exposure to various forms of irritants, the diminution of which at its best involves many years of inquiry and education. We shall before long be confronted by the appalling fact that cancer in adult life will constitute the major cause of death with all its attendant suffering on the part of the patient concerned. The only hope that can be held out to those who are afflicted with cancer is, once more in the words of Dr. Mayo, "that radium has a field of usefulness in connection with surgery, but the latter should never be disregarded where it is practicable to the patient's need."

Twenty-fourth.—To the foregoing I would like to add the suggestion that the various cancer organizations throughout the world be affiliated into an international society to bring about a more effective form of cooperation and coordination into activities which will tax the ability and the strength as well as the means of those interested to the utmost. Cancer is a world menace to all civilized mankind and the mortality will continue unchecked unless present-day methods of control become decidedly more effective than they are. The evidence as regards cancer increase remains in my judgment unshaken by all of the numerous investigations which have been made to disprove it.

RÉSUMÉ

Résumant, fort brièvement, les observations et les conclusions qui précèdent, je dirais ce qui suit:—

Premièrement.—Le cancer, au point de vue de mes investigations, est essentiellement une maladie de pays civilisés, et sa répétition fréquente est en grande partie, sans nul doute, le résultat direct d'habitudes fautives et des choses anormales de la vie, produites par les conditions complexes de l'environnement moderne, favorisé surtout par une nourriture abondante, la tension nerveuse et les nombreux accessoires de la prospérité matérielle

Deuxièmement.—Le cancer est fort rare parmi les races natives, ou soit-disant barbares, caractérisées dans le Monde Occidental par les Indiens de l'Amérique du Nord et du Sud, pour lesquelles est disponible un montant raisonnable d'information exacte, qui indique clairement la rareté relative de la maladie dans les conditions primitives de la vie.

Troisièmement.—Le cancer est aujourd'hui excessivement commun dans la vie adulte, pratiquement dans tous les pays civilisés de la terre, atteignant dans quelques cas des proportions dépassant la mortalité correspondante de par la tuberculose pulmonaire.

Quatrièmement.—Le cancer dans la plupart des pays modernes est, sans contredit, en augmentation, et dans quelques sections, y compris des portions des États-Unis, à un taux alarmant.

Cinquièmement.—L'augmentation annuelle approximative de la mortalité du cancer peut être placée à environ deux pour cent.

Sixièmement.—La mortalité totale de maladies malignes dans les portions civilisées de la population mondiale ne peut être moins de si elle n'excède pas un demi million de morts par an.

Septièmement.—Apparemment le cancer est corrélatif à une variété de circonstances conditionnées, qui toutes impliquent des agents d'irritation des différents organes et parties du corps humain. Parmi les irritants qui prédisposent à la croissance maligne, les habitudes fautives d'alimentation sont fort probablement d'importance prédominante, particulièrement dans le cancer du foie et de l'estomac et du cancer du péritoine, du rectum et des intestins.

Huitièmement.—Un autre élément important, plus que probablement d'une nature prédisposante, est le vêtement obstructif, parmi les femmes surtout, ainsi qu'il est prouvé par une forte et croissante mortalité du cancer du sein, qu'on ne rencontre pratiquement jamais parmi les femmes de races natives, vivant au milieu de conditions primitives de la vie.

Neuvièmement.—Un autre élément de plus, d'une importance très évidente, est l'habitude de fumer qui entraîne une relation directe avec le cancer de la cavité buccale parmi les hommes. Les cancers de ce genre sont excessivement rares parmi les femmes.

Dixièmement.—Il n'y a pas d'évidence que le cancer est transmis héréditairement, bien que d'autres recherches dans cette direction soient des plus urgentes. A mon avis, l'évidence découle, à cet égard, d'expérimentation animale, et n'a pas de rapport direct avec le fait du cancer parmi les êtres humains.

Onzièmement.—Des considérations similaires s'appliquent à la théorie que le cancer est transmis de personne à personne, de par l'infection. Il n'a paru aucunes preuves tendant à prouver que la théorie d'une origine parasitique n'est plus qu'affaire de conjecture. D'autre part, il n'y a pas de doute que des infections parasitiques peuvent agir comme irritants locaux, et, à cet égard, elles ont droit à une profonde considération. Un cas important ad hoc est, par exemple, le fait du cancer du foie parmi les Européens de la Côte Occidentale de l'Afrique, qu'on ne rencontre qu'en cas de fasciola hepatica du foie.

Douzièmement.—En vue de ce qui précède, la théorie de maisons de cancer, de rues de cancer, ou de localités de cancer, ne supportent pas d'analyse qualifiée. Le fait d'un pareil phénomène doit être plutôt attribué à l'âge, ou à toute autre circonstance conditionnée, que seule une investigation complète peut révéler.

Treizièmement.—Une investigation de ce genre se poursuit maintenant dans la ville de San Francisco, où un examen complet du cancer est projeté, de la mortalité pendant les trois dernières années, y compris tous les faits essentiels qui peuvent être obtenus au moyen d'une enquête supplémentaire des conditions antécédentes, comprenant, en même temps, des patients vivants, sous traitement dans les institutions locales. Cette investigation se poursuit avec la coopération du Service de Santé de San Francisco, de la Société Américaine pour le Contrôle du Cancer, de la Prudential Insurance Company of America, de la Pacific Mutual Life Insurance Company de Los Angeles, et de la John Hancock Mutual Life Insurance Company de Boston.

Quatorzièmement.—L'augmentation du cancer au cours de la dernière dizaine d'années accentue à nouveau toutes les conclusions formulées dans mon investigation compréhensive de la mortalité du cancer dans le monde entier, publiée en 1915. L'augmentation fut fort prononcée dans les États-Unis, le Canada, l'Australie et la Nouvelle-Zélande, en Angleterre et dans le pays de Galles, dans la Suisse, la Hollande, la Norvège, la Suède et le Danemark. L'évidence est moins conclusive quant à la Belgique, la France et l'Allemagne, où, sans doute, les conditions post bellum modifient profondément l'expérience de mortalité.

Quinzièmement.—L'évidence de la fréquence et de l'augmentation du cancer pour les pays du Sud de l'Europe semble appuyer la conclusion qu'une condition moins prospère de la population tend à réprimer la

tendance à un degré plus élevé dans des pays économiquement plus avancés. Cette conclusion ne s'applique pas aux grands centres de population du Sud de l'Europe qui accusent des conditions pratiquement identiques aux grands centres dans le Nord de l'Europe et autre part.

Seizièmement.—Dans les États-Unis le taux mortuaire du cancer au cours de la dernière décade a augmenté de 74 à 86 par 100,000 de population. Il est estimé conservativement que nous avons maintenant aux États-Unis environ cent mille décès de par le cancer annuellement. Pour les grandes cités américaines, représentant environ un quart de la population totale, le taux pendant 1922 atteignit 104.1 par 100,000, tandis que pour la ville de San-Francisco le taux s'éleva à 161.8 par 100,000.

Dix-septièmement.—En vue de l'évidence recueillie, la conclusion est justifiée que le cancer aujourd'hui représente la plus sérieuse menace pour la santé et l'existence de pratiquement toutes les races civilisées et que, par conséquent, la question du contrôle du cancer est d'importance suprême pour le public, la profession médicale et les autorités de santé publique des gouvernements intéressés. Bien entendu, il est inutile de parler de la prévention du cancer, du moment qu'on ne peut déterminer le début précis de la maladie. C'est pourquoi, le problème du contrôle tend plutôt à la prévention des décès de par le cancer et à l'amélioration de la malheureuse condition de malades cancéreux, résultant de méthodes de traitement plus qualifiées, visant toujours à une guérison.

Dix-huitièmement.—Ce qui a été fait à cet égard par la Société Américaine pour le contrôle du cancer provoque l'admiration de tous ceux qui sont au courant des faits. Un corps immense des laïques a été instruit concernant les faits essentiels dans le développement du cancer et la suprême urgence d'un diagnostic aussitôt que possible comme aussi d'un traitement qualifié de la maladie, sans tarder. Les efforts faits par la Société auraient été plus efficaces si l'évidence touchant la possibilité des mesures de contrôle avait été avancée plus effectivement. Il y a le plus urgent besoin d'investigations prolongées dans les résultats ultérieurs de méthodes de traitement chirurgicales, radiologiques et autres, nécessaires pour pénétrer le public de l'effrayante vérité que la grande majorité des malades cancéreux viennent se faire traiter par le médecin, ou le chirurgien, alors que la maladie a atteint un degré inopérable et que la mort s'impose décidivement.

Dix-neuvièmement.—Bien qu'on ait effectué des progrès, il reste beaucoup à faire. L'aspect le plus sinistre de la situation du cancer est l'énorme quantité du charlatanisme et de l'incompétence de nombreux médecins qui manquent de se rendre compte de la gravité de la maladie à un moment où un traitement intelligent offre encore un espoir encourageant. Ce contrôle de mauvaises méthodes de traitement comprenant des personnes non qualifiées au point de vue médical, est le devoir de l'État dont la négligence sous ce rapport est une preuve lamentable d'incapacité de la part des autorités publiques comme aussi de la part de la

profession médicale, qui auraient dû manier courageusement la solution d'un mal grandissant.

Vingtièmement.—Le besoin le plus urgent en ce moment pour l'avancement des mesures pour le contrôle du cancer est une consolidation de l'expérience chirurgicale révélant des résultats post-opérants en tenant dûment compte de la condition active du patient au moment du traitement. L'évidence fragmentaire qui est disponible est insuffisante pour des buts publics, car dans son analyse finale, les laïques ne sont frappés que par les données numériques suffisant à établir la conclusion avancée. Ce que nous voulons savoir est ce qu'ont été les résultats du traitement opératoire du cancer pendant les années récentes et de combien la vie a été prolongée ou continuée. La méthode usuelle de considérer un cas comme guéri après trois ans ne suffit plus aux besoins modernes. Nous devrions savoir combien de cas survécurent à l'opération sans rechutes 5, 10 et même 15 ans après ou plus.

Vingt et unièmement.—Également urgentes sont des investigations pour vérifier les résultats du traitement radiologique avec propre considération pour le type de cancer traité, l'âge du patient et la durée antérieure de la maladie. C'est avec fierté pardonnable à cet égard que je réfère à un rapport récent de l'Institut de l'État de New-York pour la Sûreté de Maladies Malignes d'après lequel "des progrès importants furent effectués dans le traitement du cancer pendant l'année écoulée" et "que des mesurages comparatifs des rayons pénétrants du rayon radium ou X montrent que le radium a un avantage d'environ 10% mais que les améliorations apportées au rayon X en font presque l'égal du radium comme traitement du cancer."

C'est une révélation des plus importantes qui suggère l'usage plus répandu du traitement par rayon X que, naturellement, on peut se procurer plus aisément que le radium. D'après le rapport sous-indiqué "le temps pour donner une dose complète de traitement du cancer par rayon radium ou X a été réduit de huit heures, il y a un an, à deux heures à l'heure actuelle." Il en découle "qu'une des avances les plus précieuses est dans le traitement combiné des rayons radium et X et que l'avantage de cette méthode est très marqué." Les résultats montrent qu'un tiers environ de tous les cas de cancer utérin qui sont traités donnèrent des résultats permanents et qu'un grand nombre furent matériellement assistés. La grande difficulté dans toute la question est d'obtenir des cas de cancer à une phase peu avancée. Mais dans ces cas-là l'Institut est à même de signaler que pour le cancer de la lèvre 80% furent guéris, tandis que dans les cas opérables 60% furent guéris et dans les cas inopérables 40%. C'est une preuve de ce genre qui est des plus utiles, à l'égard des efforts modernes pour atteindre les laïques.

Vingt-deuxièmement.—Je suis décidément d'avis que le cancer devrait être fait maladie à signaler. C'est la propre fonction du Département de Santé de prendre connaissance des conditions qu'on trouve fréquemment dans les cas de cancer avant que d'être sous traitement, tandis que d'autre part c'est essentiellement la fonction du Département de Santé de protéger

la communauté contre les pratiques de ceux qui ne sont pas qualifiés à rendre les services convenables qui s'imposent.

Vingt-troisièmement.—Finalement je puis renchérir sur la conviction qui s'impose à moi, comme résultat d'une enquête laborieuse dans ce sujet et appuyée par le meilleur jugement chirurgical de la période actuelle, à savoir, comme l'a dit récemment Dr. Mayo "qu'il n'y a pas de guérison médicale pour le cancer." L'espoir du patient est dans le traitement chirurgical et radiologique qualifié ou le traitement par rayon X, aussitôt que possible, complété par telles méthodes qui autrement pourraient être approuvées par le chirurgien traitant. La mortalité énorme de par le cancer est sans contredit le résultat indubitable de mauvaises habitudes, de la nourriture et du danger de diverses formes d'irritants dont la diminution implique tout au plus beaucoup d'années de recherches et d'éducation. Sous peu nous devons affronter le fait terrifiant que le cancer dans la vie adulte constituera une cause majeure de décès avec toute la souffrance qui l'accompagne pour le patient qui en est frappé. Le seul espoir qui s'offre à ceux qui sont affligés du cancer est une fois de plus la parole du Dr. Mayo "que le radium offre un champ d'utilité conjointement avec la chirurgie, mais que celle-ci ne devrait jamais être négligée lorsqu'elle est praticable pour les besoins des patients."

Vingt-quatrièmement.—A ce qui précède je voudrais ajouter la suggestion que les diverses organisations mondiales relatives au cancer s'associasent en une Société internationale pour effectuer une forme plus efficace de coopération et de coordination en activités qui aiguillonneront l'habileté et la force comme aussi les moyens pécuniaires des intéressés au plus haut degré. Le cancer est une menace mondiale pour l'humanité civilisée toute entière et la mortalité continuera sans frein jusqu'à ce que les méthodes actuelles de contrôle deviennent décidément plus efficaces qu'elles ne le sont. L'évidence à mon avis en ce qui concerne la croissance du cancer, reste inébranlable, quelles que soient les nombreuses investigations qui furent faites pour la réfuter.

Translated from the English
By Théodore Perrin.

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By FREDERICK L. HOFFMAN, 1913-1923

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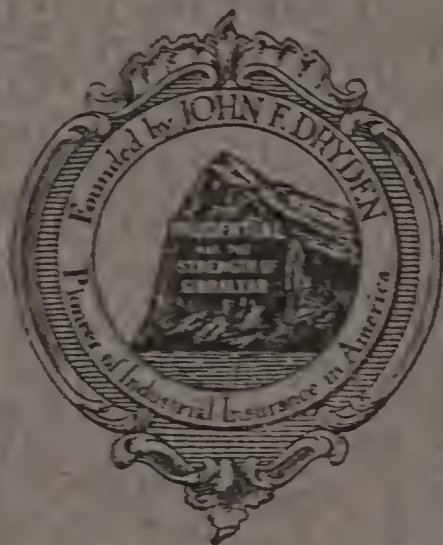
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